IndianaMap Business Case

Introduction

Indiana needs a single, accurate, high-quality electronic map.

The portfolio of projects needed to create this statewide map has been given the brand identification of "The IndianaMap Program." **The purpose of the IndianaMap is to enhance public safety, economic development, land and water resources, and good government** by encouraging and facilitating the establishment of a consistent geographic information infrastructure for Indiana that is accurate, maintained, and accessible to those who need it.

Indiana needs a single, accurate, high-quality electronic map because…

1. Electronic maps should be made once and paid for once
2. Better informed decision-makers make better decisions
3. Emergency responders need maps that span city and county lines
4. Pooling resources saves taxpayer dollars
5. Collaborative projects make better maps than any individual agency could afford
6. Access to information empowers citizens

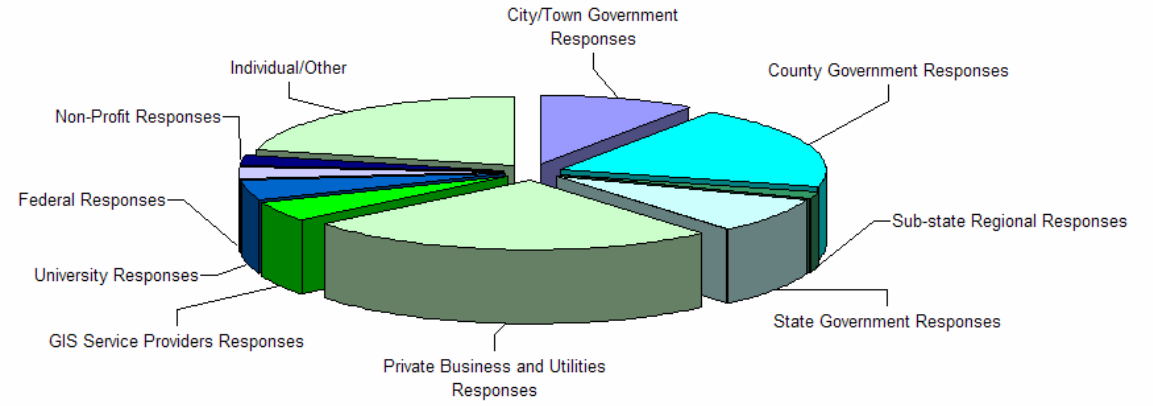
This document outlines the status of **Geographic Information Systems** (GIS) implementation in Indiana, and particularly within State government; describes how the IndianaMap will help State agencies fulfill their program missions; and shows how the IndianaMap will provide enough tangible benefits that a return on investment to taxpayers will easily be seen in four years.

GIS in Indiana

GIS technology is being used by a growing number of user groups at all levels of government and in the private sector. A 2006 statewide survey on GIS technology (conducted by the Indiana Geographic Information Council) provides information on the extent of current GIS use in Indiana (Figure 1). These numbers are indicative of a long-term trend toward GIS technology adoption by public agencies – a trend that continues to accelerate, driving GIS use by a large number of state, regional, and local agencies:

- 20 state government agencies currently use GIS technology (Table 1)
- 8 state agencies have indicated a need to acquire GIS capabilities
- 20 federal government agencies in Indiana use GIS
- 10 sub-state regional agencies use GIS
- At least 79 of 92 county governments (increasing at high rate) use GIS
- More than 43 cities and towns use GIS

Figure 1. Types of GIS users/organizations in Indiana (among 566 survey respondents).



State Agency Missions and GIS Requirements

An analysis of State agency programs (summarized in Table 1) reveals the importance of geographic information. Almost every State agency in Indiana has mission objectives that depend on geographic information to be successful. Several of these agencies already have active GIS programs while others are in the process of adopting the technology. Many State agencies have indicated that high-quality electronic map data – such as would be created, integrated, and maintained by the IndianaMap – are essential for performing their statutory responsibilities.

Currently, no formally authorized entity exists within the State to support the GIS requirements of these agencies, programs and statutory responsibilities.

There is no organized program in place, and no designated funding, to accomplish the IndianaMap Program.

Table 1. State agency missions relative to their geographic information requirements.

Agency/Program	Mission	GIS Required For..	GIS in Use
Indiana State Board of Animal Health	Prevent and suppress contagious and infectious diseases among the livestock	Almost every aspect of agency's mission tied to geographic information; management of wild animal and domestic livestock disease outbreaks; emergency planning, mitigation and response; mass-culling carcass disposal; public relations	✓
Indiana Business Research Center	Resource for data and analysis of economic and demographic data	Almost every aspect of organization's mission tied to geographic information; development of statewide site finder application; main resource for highly accurate and maintained geographic information; State-appointed liaison to the US Census Bureau; maps and charts available through website	✓
Indiana Bureau of Motor Vehicles	Distribute motor vehicle excise tax	Allocation of revenues to the taxing district in which the registrant resides; County Auditor distribute funds to units of taxing district in the same manner as property taxes	Opportunity exists
Indiana Department of Agriculture	Regulation of food processing and tracking agricultural products and markets	Information on source and supply chain; pesticides program management; land resources management and farmland preservation; facilitate the protection of Indiana's land and water; provide technical, educational, and financial assistance to citizens to	✓

Agency/Program	Mission	GIS Required For..	GIS in Use
		solve erosion and sediment-related problems occurring on the land or impacting public waters; promoting agricultural economic development and biofuels	
Indiana Department of Corrections	Responsible for released offenders	Tracking released convicts and monitoring their locations; managing post-release programs from a geographical perspective; management of the Indiana Sex Offender Registry and compliance with geographic restrictions near "safe zones" – schools, parks, etc.	✓
Indiana Department of Education	Public student education and welfare	Planning for siting and expansion of schools; delineation of student catchment areas; school districts' management of school bus transportation; infrastructure management; analysis of migration of students for assessing high school drop-out rates; evaluation of charter school student distribution and effect on public school finance; measure effectiveness and equity related to distribution of statewide funding	Opportunity exists
Indiana Department of Environmental Management	Maintain quality of public land, water and air	Analysis of all aspects of water, land, and air quality; regulation and permit management; waste management planning; environmental clean-up	✓
Indiana Department of Homeland Security	Security and protection of Indiana's citizens and infrastructure	Almost every aspect of agency's mission tied to geographic information; provide the State's authoritative source of locational information; man-made and natural disaster planning, response, and recovery; support a common operating picture for State and local emergency response and planning; support the Indiana Intelligence Fusion Center; collect, integrate, evaluate, analyze, disseminate, and maintain criminal intelligence information; support governmental agencies and private organizations in detecting, preventing, investigating, and responding to criminal and terrorist activity	✓
Indiana Department of Local Government Finance	Promotion of a fair and equitable tax system for Indiana	Support property tax assessment and annual review and approval of the tax rates and levies of every political subdivision in the state, including all counties, cities, towns, townships, school corporations, libraries, and other entities with tax levy authority; promote consistent assessing procedures; statewide assessment of public utilities; personal property auditing; assisting in equalization studies	Opportunity exists – under review by agency
Indiana Department of Natural Resources	Protect, enhance, preserve, and wisely use natural, cultural, and recreational resources	Almost every aspect of agency's mission tied to geographic information; wildlife management and habitat enhancement; inventorying, protecting, managing, and maintaining the State's forestry resources; management of well inventory; maintenance and modernization of flood hazard maps	✓
Indiana Department of Revenue	Tax collection	Verification of business reporting by appropriate tax districts and income tax allocation to appropriate government local districts	Opportunity exists – need identified by agency
Indiana Department of Transportation	Plan, build, maintain, and operate Indiana's transportat-ion systems	All programs are heavily dependent on GIS; transportation planning and design; traffic planning and management; infrastructure maintenance; right-of-way and property acquisition; I-69 corridor,	✓

Agency/Program	Mission	GIS Required For..	GIS in Use
		Major Moves and other transportation initiatives of statewide significance; regulatory programs that require geographic-based tracking, such as traffic accident reporting	
Indiana Economic Development Corporation	Growing and retaining existing while attracting new business	Identifying sites for development and supporting economic development; pre-permitting of sites based on environmental and zoning regulations for "shovel ready" program; allocation and management of funding using information on demographics, infrastructure, and economy; site and building database; attracting new ventures like the Honda plant	Opportunity exists – need identified by agency
Indiana Family and Social Services Agency	Oversee programs for children and adults in need of financial or medical assistance	Provisioning, planning and management; site-specific information on demographics and statistics; program planning; allocation of social services and licensing programs for a geographically distributed citizenry and business community	Opportunity exists – need identified by agency
Indiana Geological Survey	Source for geo-graphic information accessed through the GIS Atlas for Indiana; IndianaMap partner	Mission very dependent on mapping and analysis of mineral resources and natural hazards; oversees regulatory programs	✔
Colleges and Universities	Instruction, research, and outreach directly and indirectly related to geography	Major GIS research and instruction at Indiana University, Purdue University, IUPUI, Indiana State University and Ball State University; smaller programs at other state universities and community colleges; facilities management; outreach; recruiting; alumni development	✔
Indiana Legislative Services Agency	The Office of Census Data assists the General Assembly and all levels of Indiana government	Redistricting; maintain the congressional and legislative district boundaries throughout the decade; suggest census block boundaries to the Bureau of the Census for the 2010 census; collect municipal annexation ordinances; maintain boundaries for over 5000 voting precincts statewide	✔
Indiana National Guard	Protect the State and nation from natural and man-made disasters	Military facility and operations planning; facilities management; outreach; recruiting	✔
Indiana Office of Energy and Defense Development	Promote alternative power, energy efficiency, reintegra-tion of former bases	Evaluation of source and distribution of energy resources; track and manage defense-related resources and contractors; geographic distribution of grant-funded initiatives	Opportunity exists – need identified by agency
Indiana Office of the Attorney General	Protect the rights, freedoms and safety of Indiana citizens	Sex Offender Registry information and related locational information to the public	✔
Indiana Secretary of State	IN Help America Vote Program (HAVA)	Mandated responsibility for voting reforms, including development of a statewide voter registration system	✔
Indiana State Department of Health	Supports economic prosperity and quality of life by promoting, protecting and providing for the health of Hoosiers	Almost every aspect of agency's mission; planning, provisioning, and management for health services; site-specific information on demographics and health statistics; health program planning; allocation of services and licensing programs; disease tracking; environmental public health programs; health alerts	✔
Indiana State Lands Office	Repository for deeds and plats of land owned by the State	Almost every aspect of agency's mission tied to geographic information; management of state land and real property; asset management; public data dissemination	✔

Agency/Program	Mission	GIS Required For..	GIS in Use
Indiana State Library	State Data Center is a source for geo-graphic information; IndianaMap partner	Making the Census, demographic and economic statistics widely available; provide data and services to all sectors of the community including government agencies, businesses, academia, nonprofits, and the general public; products and services are used in marketing, economic development, community planning and analysis, grant writing, business start-ups, and much more	✓
Indiana State Police	Geographic information and GIS tools are needed for	Managing public safety; analyzing and recording locational information of resources and incidents	Opportunity exists – under agency review
Indiana State Treasurer/Enhanced 911 Board	Distribution of funding and compliance oversight for local E-911 services	Locate callers; identify service territories; route response vehicles; support emergency services for police, fire and ambulance; manage compliance with mandates for cell phone location and 3-D capabilities for multi-storied buildings; distribution of $15M to local government for GIS technologies and geographic data development that support E-911 implementation	✓
Indiana Utility Plant Protection Services	Promote damage prevention and public awareness of underground facilities	Almost every aspect of agency's mission; Call Before You Dig call center; urgent need for highly accurate and current geographic information	✓
Indiana Utility Regulatory Commission	Assure that utilities and others use adequate planning and resources for the provision of safe and reliable utility services	Oversee more than 600 utilities that operate in Indiana; regulates electric, natural gas, telecommunications, steam, water and sewer utilities – utilities may be investor-owned, municipal, not-for-profit or cooperative utilities or they might operate as water conservancy districts; regulates environmental compliance plans, service territories, construction projects, and acquisition of additional plants and equipment	✓

State agencies have benefited from the work of the Indiana Geographic Information Council and the recently-formed State of Indiana GIS Center of Excellence. However, coordination and data sharing services are still inadequate, and only marginally supported. Duplication and redundancies in operations and data management increase the overall cost of GIS. Plus, there is a large amount of data which does not exist, or needs to be assembled from different sources.

The data comes from both State and local government

Many agencies spend countless hours collecting, combining and cleaning up data BEFORE they can even start doing their jobs. There are multiple instances where more than one State agency has contacted a county government for the same data; and sadly, there are cases where different workgroups within the same agency have duplicated efforts to find and clean up GIS data from the same cities and counties. **Every hour spent is taxpayer money wasted by not having a coordinated IndianaMap program** (Figure 2).

Figure 2. Example of effort spent every time an agency needs statewide "local" data. This example (collecting data without maps) is similar to the level of effort expended every time a state agency needs integrated local GIS data.

When Indiana needed to evaluate the fairness of its new property reassessment system, the biggest obstacle was the data:

"The county parcel data had to be cleaned and put into a database. Assessors and auditors are required to provide parcel-level data to the Legislative Services Agency (LSA) and DLGF in a specified format. Some vendors and counties worked to adhere to the standards, while others did not. Some counties provided data only after repeated contacts by LSA.

Reading, decoding, and understanding the nature of the data included in the parcel data files has proven to be a major undertaking. The problems are many. Because of the myriad of systems and vendors, the data was received in many formats, even though there is a standard format requirement. There were no reporting or standard format requirements for the 2001/2002 data. LSA collected the pre-reassessment data in any format that was available.

The following issues are only a portion of the major obstacles faced in analyzing the parcel data. Each of these problems had to be solved in order to use the data. Each different county system stores data differently. The number of files and relation between them differ by system. Some counties include non-property tax assessments (i.e., ditch assessments) and records for non-taxable parcels in the data. Some counties populate some fields while others do not. Some counties identify deductions differently than others. Most counties do not use or report the state tax district codes. Many counties have auditor and assessor systems that use different parcel identifiers which makes matching records more difficult. Many counties upgraded or changed systems between 2001/2002 and 2003 which makes matching records more difficult. Property use codes were missing or invalid for many parcels. Each county handles and reports exempt property differently."

- Indiana Legislative Services 2005, Indiana County Property Tax Reassessment Studies Property Tax Payments 2002-2003

And this scenario is repeated hundreds of times among multiple agencies (such as Indiana's voter registration system, sex offender registry, transportation planning, health programs, environmental permitting programs, land management, road maintenance, etc.); and the same duplication holds true for local government, utilities, and the private sector.

Budget for the IndianaMap

The IndianaMap is comprised of "framework data" – those layers of information of value to a wide user community. Framework data include, among others, the seven layers listed in the budget table below. The IndianaMap program budget includes the organization, staff, equipment, technology, resources and authorization required to manage the activities and projects.

The proposed annual budget for the IndianaMap is $6,516,000 for joint implementation among State and local government (detailed in Figure 5). The budget does not call for funding the entire cost of all Indiana geographic framework data layers. Rather, it recommends a level of funding appropriate to leverage ongoing investments and develop service capacity to meet State agency business needs.

The IndianaMap aligns with the Governor's statewide effort to find creative new ways to provide better services at lower cost to taxpayers.

The **proposed budget is scaleable** in that funding can be directed at the top priority framework data layers if full funding is not attained. For example, the budget could be scaled accordingly:

- The annual budget for statewide orthophotography only, on an on-going rotational basis, updating one-third of the state each year, would be approximately $3.3 million

OR

- The annual budget for orthophotography, roads and addresses, and parcels (land ownership) would be approximately $5.9 million

It is important to note that all the framework layers identified in the IndianaMap are considered essential to support the business needs of the State. It is anticipated that within four years all framework data will be complete and maintained if the program is fully funded. Without full funding, it will take much longer to complete all layers and the full benefits of the IndianaMap program will be delayed accordingly.

Figure 3 depicts the estimated costs for IndianaMap framework data development and maintenance. Again, the proposal does not call for funding the entire cost of all Indiana geographic framework data layers. Rather, it recommends a level of funding with reasonable expectations to leverage new and ongoing investments in the form of external grants and cost-sharing.

Figure 3. Annual costs over a 10 year period.

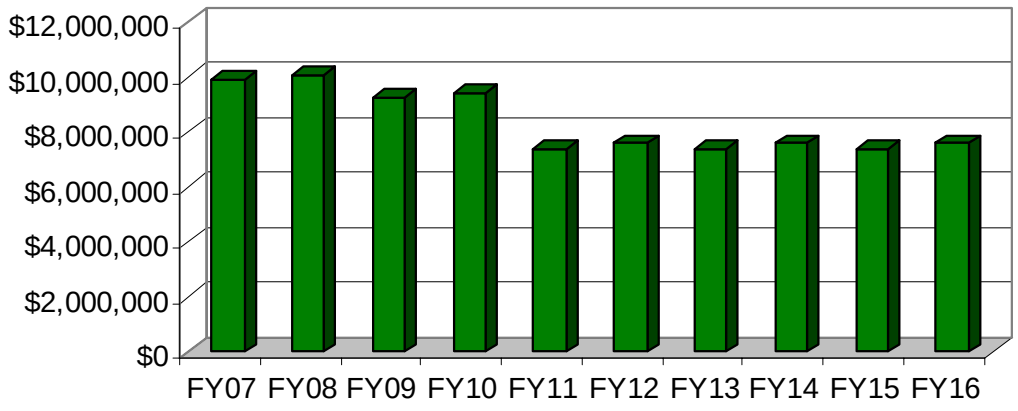
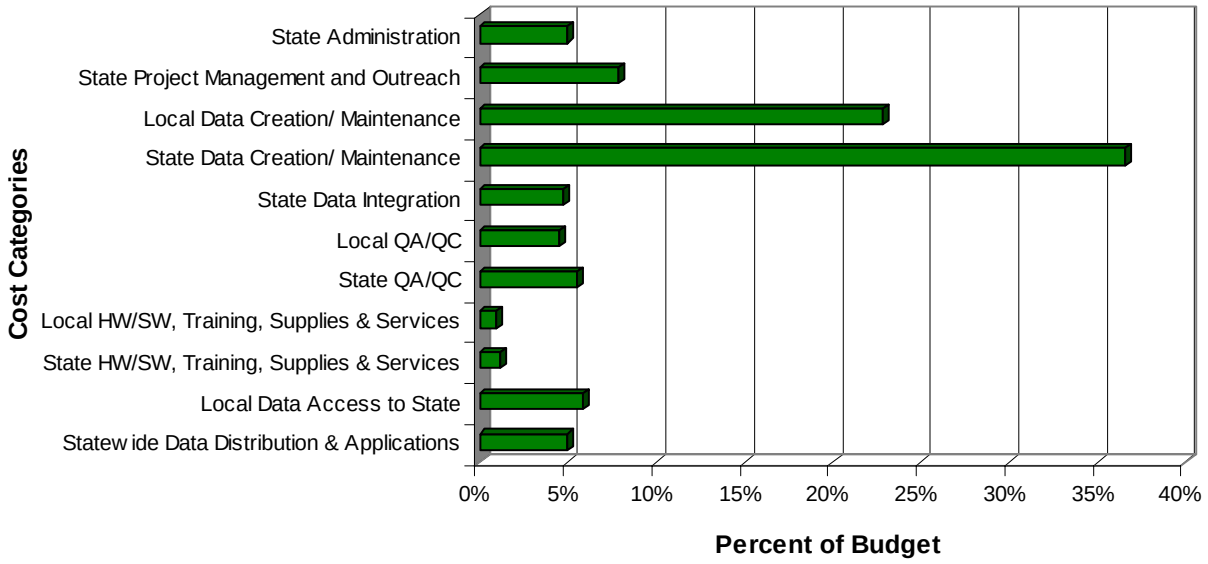


Figure 5. IndianaMap budget. Program totals and cost category subtotals are shown in the first row (yellow); the remaining rows itemize framework data layers and detailed cost categories.

Budget	Annual Recommended	2-Year Budget	State Administration	State Project Management and Outreach	Local Data Creation/ Maintenance	State Data Creation/ Maintenance	State Data Integration	Local QA/QC	State QA/QC	Local HW/SW, Training, Supplies & Services	State HW/SW, Training, Supplies & Services	Local Data Access to State	Statewide Data Distribution & Applications
IndianaMap Framework Data Program	**$6,516,000**	**$13,032,000**	$325,800	$513,500	$3,715,720	$155,000	$311,200	$621,600	$30,000	$62,240	$75,080	$380,060	$325,800
Orthophotography (1/3 state per year rotation)	$3,279,000	$6,558,000	$163,950	$327,900	$2,229,720			$327,900			$65,580.00		$163,950.0
Elevation	$50,000	$100,000	$2,500	$5,000		$34,000			$5,000		$1,000.00		$2,500.0
*Roads & Addresses	$1,220,000	$2,440,000	$61,000	$61,000	$610,000		$122,000	$122,000		$24,400.00		$158,600.0	$61,000.0
*Parcels (Land Ownership)	$1,450,000	$2,900,000	$72,500	$72,500	$725,000		$145,000	$145,000		$29,000.00		$188,500.0	$72,500.0
*Boundaries	$350,000	$700,000	$17,500	$35,000	$105,000	$70,000	$35,000	$17,500	$17,500	$7,000.00	$7,000.00	$21,000.0	$17,500.0
Hydrography	$75,000	$150,000	$3,750	$7,500		$51,000			$7,500		$1,500.00		$3,750.0
Geodetic Control	$92,000	$184,000	$4,600	$4,600	$46,000		$9,200	$9,200		$1,840		$11,960.0	$4,600.0

Among the cost categories (Figure 4), approximately 75% of the budget is directed toward immediate off-set costs to local government (including State management, creation, and maintenance of orthophotography).

Figure 4. Cost Categories and summary of IndianaMap development for annual operational budget.



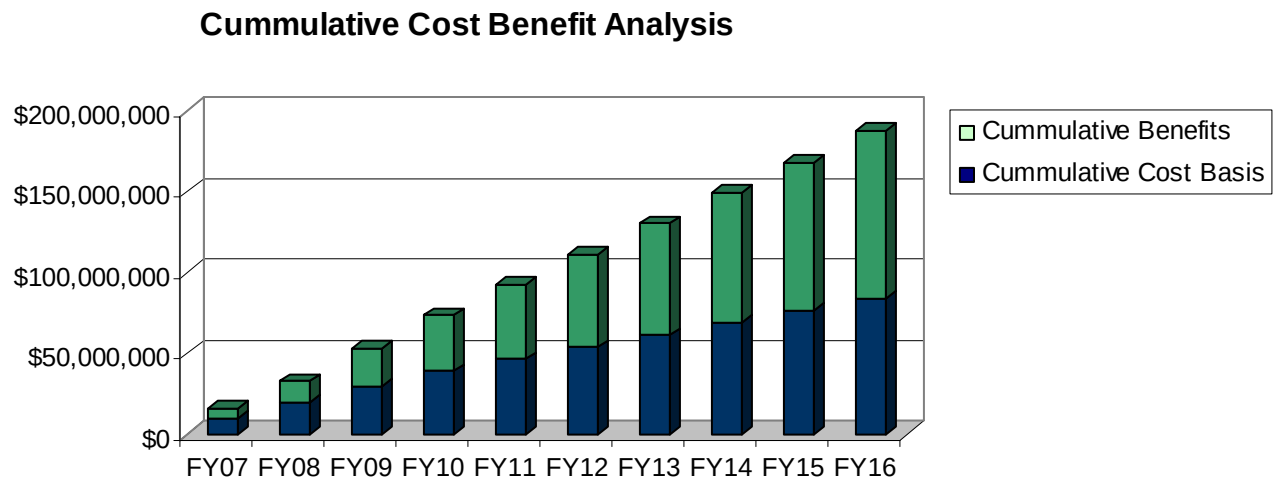
Cost Benefit Evaluation

The benefits of implementing the IndianaMap are clear and long-term in nature. These benefits show a strong financial return on investment, including concrete cost savings and cost avoidance, as well as a wide range of intangible business values which are less easily quantified.

Return on Investment

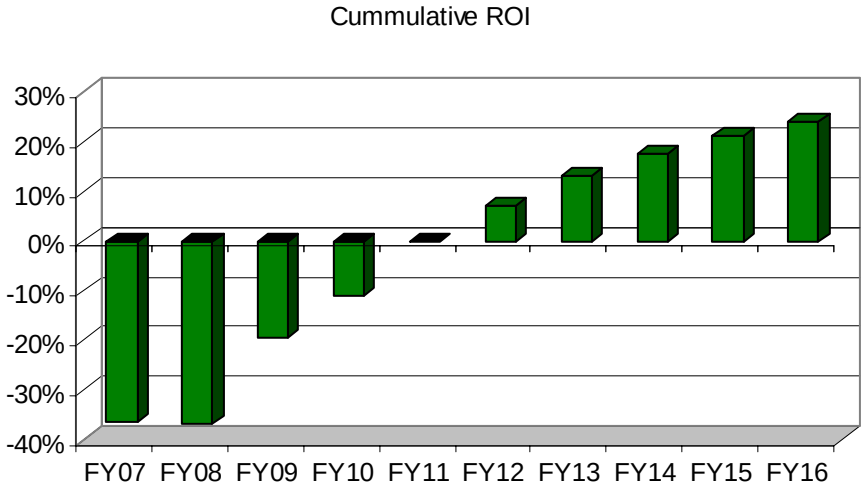
The return on investment potential for the IndianaMap is massive. The following charts depict a very conservative estimate of the return on investment. These figures only represent a portion of the savings realized by local governments, State government, and taxpayers (Figure 6). From documented experience in Indiana and around the country, we know there will be significant savings in addition to those depicted below.

Figure 6. Cumulative costs and benefits.



Conservative estimates show a positive return on investment after only 4 years (Figure 7). Again, this is based on a small selection of State, local, and taxpayer savings.

Figure 7. Ten-year return on investment based on limited information gathered from state and local government.



Finally, **one of the greatest benefits of the IndianaMap is using it over and over again** for multiple purposes (Figure 8). Not only does this build consistency resulting in interoperable data among all levels of government, **the more it is used the more its value is realized.**

Figure 8. An example of "collateral benefits" of the IndianaMap.

Coordinated Mapping Leverages Investments!

In 2005, Indiana demonstrated success with a statewide map that is used by all levels of government, demonstrating the principle "build once, use many times." For example:

Local use: When Kyle Johnson, **Delaware County GIS Administrator** received the 2005 IndianaMap orthophotography, he immediately took advantage of the new data.

"We have used the orthos in response to emergency management incidents by helping verify the existence of trailers with hazardous materials in them during the spring of 2005. Most recently we have performed analysis on a potentially dangerous log jam upstream from Muncie that measures over three-quarters of an acre in size, that could possibly break lose during a high water event and send tons of debris towards bridges in Muncie.

We are also using it to update our Land Use dataset and geocoded streets layers. Our sheriff's Swat team and drug task force…will use them to gather intelligence and help plan raids on suspected methamphetamine and other drug houses. **The uses are limitless!**"

State use: Indiana **Legislative Services Agency** - Office of Census Data uses the 2005 IndianaMap orthophotography for redistricting and to maintain the congressional and legislative district boundaries; to collect municipal annexation ordinances; and maintain boundaries for over 5000 voting precincts statewide.

"The IndianaMap and related orthophotography are of inestimable value to the work and functions of our office. For a variety of reasons, **it is absolutely essential** that these maps and their related attributes are regularly updated and maintained."

Conclusion

Indiana needs the IndianaMap Program so that government entities and businesses can be more effective, efficient and productive. Public agencies and many other organizations in Indiana depend on geographically referenced information to support day-to-day operations, planning and decision-making. The IndianaMap will ensure that the information people need most is collected consistently, maintained accurately, and made widely available.

A conservative study of the benefits of the IndianaMap show tangible and intangible value to state and local government; with a return on investment for taxpayers in four years.

The value of implementing the Indiana Map Program include:

- Indiana will have a single, comprehensive, authoritative map, specifically designed for the most demanding projects and applications.

- Multi-jurisdictional geographic information management will be more efficient - and in some cases possible - for the first time.
- Government agencies and businesses can more fully capitalize on past and current investments in GIS.
- There will be a reduction in redundancy and duplication in data collection, data maintenance, data storage, and system resources across and within organizations.
- "Have-Not" portions of the state will be assisted, enabling the creation of a complete, statewide map of framework layers.
- Opportunities for leveraging grant funds can be more fully exploited.

The sooner Indiana implements the IndianaMap, the sooner we can start to realize these enormous benefits to State agencies, local government, businesses and taxpayers.

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